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10/782,565	02/19/2004	Andreas Weber	15436.212.1	5154

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EXAMINER

BELLO, AGUSTIN

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/782,565

Applicant(s)

WEBER, ANDREAS

Examiner

Agustin Bello

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-23 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 18 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5, and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Bhagavatula (U.S. Patent No. 4,889,404).

Regarding claims 1, Bhagavatula teaches a bi-directional communications module configured for propagating transmission and reception of optical data along dual optical cables, the module comprising: a first transmitter (reference numeral 15-1 in Figure 1) configured for transmitting data on a first wavelength channel (e.g. λ_2 in Figure 1) onto a first optical fiber (reference numeral 14-1 in Figure 1); a first receiver (reference numeral 21-1 in Figure 1) configured for receiving data on a second wavelength channel (e.g. λ_1 in Figure 1) from the first optical fiber (reference numeral 14-1 in Figure 1); a second transmitter (reference numeral 20-2 in Figure 1) configured for transmitting data on the second wavelength channel (e.g. λ_1' in Figure 1, wherein $\lambda_1' = \lambda_1$ according to column 5 lines 38-48) on a second optical fiber (reference numeral 14-2 in Figure 1); and a second receiver (reference numeral 19-2 in Figure 1) configured for receiving data on the first wavelength channel (e.g. λ_2' in Figure 1, wherein $\lambda_2' = \lambda_2$ according to column 5 lines 38-48) from the second optical fiber (reference numeral 14-2 in Figure 1), wherein the first transmitter, the second transmitter, the first receiver, and the second receiver comprise a bi-directional communications module (reference numeral 10 in Figure 1).

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Regarding claim 2, Bhagavatula teaches that the first transmitter and the first receiver comprise a first bi-directional transceiver (reference numeral 15-1, 16-1, and 21-1 in Figure 1) and the second transmitter and the second receiver comprise a second bi-directional transceiver (reference numeral 17-2, 19-2, and 20-2 in Figure 1).

Regarding claim 3, Bhagavatula teaches that the first bi-directional transceiver comprises a first beam splitter (reference numeral 16-1 in Figure 1) for reflecting only one of the first or second wavelength channels while permitting passage therethrough of the non-reflected wavelength channel; and the second bi-directional transceiver further comprises a second beam splitter (reference numeral 17-2 in Figure 1) for reflecting only one of the first or second wavelength channels while permitting passage therethrough of the non-reflected wavelength channel.

Regarding claim 5, Bhagavatula teaches that the first receiver comprises a photodetector (reference numeral 21-1 in Figure 1).

Regarding claim 7, Bhagavatula teaches that the first wavelength channel (e.g. λ_2 in Figure 1) and the second wavelength channel (e.g. λ_1 in Figure 1) are of sufficiently different wavelengths to prevent the receivers from experiencing optical crosstalk due to internal reflection from the outgoing optical signals (inherent in that $\lambda_1 \neq \lambda_2$ in Figure 1).

Regarding claim 8, Bhagavatula teaches that first and second duplex connectors (inherent in the bi-directional nature of the system) that are configured to mate with connectors affixed to the first optical fiber and the second optical fiber.

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Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhagavatula in view of Hoag (U.S. Patent No. 5,712,936) and the prior art cited by the applicant in the specification.

Regarding claims 9 and 23, as noted in the rejection of claim 1, Bhagavatula teaches a first and second bi-directional transceiver and the accompanying elements. Bhagavatula differs from the claimed invention in that Bhagavatula fails to specifically teach the use of a duplex connector configured for receiving a duplex optical cable having a first optical fiber and second optical fiber, connecting the first and second transceiver/receivers therethrough. However, Hoag in the same field of optical communication teaches a one such duplex connector (see Figures and throughout Hoag). Furthermore, as noted by the applicant in the specification (page 4 paragraph [0010]), cables having first and second optical fibers therein are well known in the art and readily available. One skilled in the art would have been motivated to employ a duplex connector such as that taught by Hoag and the paired fiber cable well known in the art, in order to increase the amount of data throughput. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a duplex connector such as that taught by Hoag and the well known paired fiber cable in the device of Bhagavatula.

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Regarding claim 10, Bhagavatula teaches that the first bi-directional transceiver comprises a first beam splitter (reference numeral 16-1 in Figure 1) for reflecting only one of the first or second wavelength channels while permitting passage therethrough of the non-reflected wavelength channel; and the second bi-directional transceiver further comprises a second beam splitter (reference numeral 17-2 in Figure 1) for reflecting only one of the first or second wavelength channels while permitting passage therethrough of the non-reflected wavelength channel.

Regarding claim 11, Bhagavatula differs from the claimed invention in that Bhagavatula fails to specifically teach that the module is compatible with small form factor pluggable (SFP) standards. However, the small form factor pluggable (SFP) standard is well known in the art. One skilled in the art would have been motivated to craft the module of Bhagavatula to be compatible with small form factor pluggable (SFP) standards in order to reduce the overall footprint of the module, thus conserving space. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to craft the module of Bhagavatula to be compatible with small form factor pluggable (SFP) standards.

Regarding claim 12, Bhagavatula teaches that the first wavelength channel (e.g. λ_2 in Figure 1) and the second wavelength channel (e.g. λ_1 in Figure 1) are of sufficiently different wavelengths to prevent the receivers from experiencing optical crosstalk due to internal reflection from the outgoing optical signals (inherent in that $\lambda_1 \neq \lambda_2$ in Figure 1).

5. Claims 4, 6, 11, and 13-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhagavatula.

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Regarding claims 4, 11, 16, and 21, Bhagavatula differs from the claimed invention in that Bhagavatula fails to specifically teach that the module is compatible with small form factor pluggable (SFP) standards. However, the small form factor pluggable (SFP) standard is well known in the art. One skilled in the art would have been motivated to craft the module of Bhagavatula to be compatible with small form factor pluggable (SFP) standards in order to reduce the overall footprint of the module, thus conserving space. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to craft the module of Bhagavatula to be compatible with small form factor pluggable (SFP) standards.

Regarding claim 6, Bhagavatula teaches the use of a laser (reference numeral 15-1, 15-2 in Figure 1), but differs from the claimed invention in that Bhagavatula fails to specifically teach that the laser is selected from a group consisting of a distributed feedback laser and a Fabry-Perot laser. However, both of these lasers are very well known in the art and readily available. One skilled in the art would have been motivated to select the laser from the group claimed since these types of laser are readily available and relatively inexpensive. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to select the laser from a group consisting of a distributed feedback laser and a Fabry-Perot laser.

Regarding claim 13, Bhagavatula teaches a first bi-directional communications module, comprising, a first bi-directional transceiver, the first bi-directional transceiver comprising: a first transmitter (reference numeral 15-1 in Figure 1) configured for transmitting data along a first wavelength channel (e.g. λ_2 in Figure 1); and a first receiver (reference numeral 21-1 in Figure 1) configured for receiving data along a second wavelength channel (e.g. λ_1 in Figure 1); and a second bi-directional transceiver, the second bi-directional transceiver comprising: a

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second transmitter (reference numeral 20-1 in Figure 1) configured for transmitting data along the second wavelength channel (e.g. λ_1 in Figure 1); a second receiver (reference numeral 19-1 in Figure 1) configured for receiving data along the first wavelength channel (e.g. λ_2 in Figure 1), and a second bi-directional communications module, comprising: a third bi-directional transceiver, the third bi-directional transceiver comprising: a third transmitter (reference numeral 15-2 in Figure 1) configured for transmitting data along a first wavelength channel (e.g. λ_2' in Figure 1); and a third receiver (reference numeral 21-2 in Figure 1) configured for receiving data along a second wavelength channel (e.g. λ_1' in Figure 1); and a fourth bi-directional transceiver, the fourth bi-directional transceiver comprising: a fourth transmitter (reference numeral 20-2 in Figure 1) configured for transmitting data along the second wavelength channel (e.g. λ_1' in Figure 1); a fourth receiver configured (reference numeral 19-2 in Figure 1) for receiving data along the first wavelength channel (e.g. λ_2' in Figure 1); and a first optical fiber (reference numeral 14-1 in Figure 1); and a second optical fiber (reference numeral 14-2 in Figure 1).

Bhagavatula differs from the claimed invention in that Bhagavatula fails to specifically teach that the first optical fiber is in optical communication with each of the first transceiver and the fourth transceiver and that the second optical fiber is in optical communication with each of the second transceiver and the third transceiver. However, one skilled in the art would clearly have recognized that it would have been possible to arrange the system of Bhagavatula in any of a variety of configurations including that claimed by the applicant. One skilled in the art would have been motivated to do so in order to meet design requirements or as a matter of choice. Furthermore, it is clear that the various elements of Bhagavatula could have been arranged in any of a several different ways without departing from the spirit or scope of the invention.

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Therefore, it would have been obvious to one skilled in the art at the time the invention was made to arrange the transceivers, their operating wavelengths, and the fibers interconnecting the transceivers in arrangement claimed.

Regarding claims 14 and 20, Bhagavatula teaches that the first bi-directional transceiver comprises a first beam splitter (reference numeral 16-1 in Figure 1) for reflecting only one of the first or second wavelength channels while permitting passage therethrough of the non-reflected wavelength channel; and the second bi-directional transceiver further comprises a second beam splitter (reference numeral 17-2 in Figure 1) for reflecting only one of the first or second wavelength channels while permitting passage therethrough of the non-reflected wavelength channel.

Regarding claims 15 and 18, Bhagavatula differs from the claimed invention in that Bhagavatula fails to specifically teach the wavelength configuration between the first and second modules. However, given that Bhagavatula teaches that the propagation wavelengths can be the same or different, it would have been obvious to one skilled in the art at the time the invention was made to design the system according to the wavelength configuration claimed. One skilled in the art would have been motivated to do in order to meet design requirements.

Regarding claims 17 and 22, Bhagavatula teaches that the first wavelength channel (e.g. λ_2 in Figure 1) and the second wavelength channel (e.g. λ_1 in Figure 1) are of sufficiently different wavelengths to prevent the receivers from experiencing optical crosstalk due to internal reflection from the outgoing optical signals (inherent in that $\lambda_1 \neq \lambda_2$ in Figure 1).

Regarding claim 19, Bhagavatula teaches that the first transmitter and the first receiver comprise a first bi-directional transceiver (reference numeral 15-1, 16-1, and 21-1 in Figure 1)

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and the second transmitter and the second receiver comprise a second bi-directional transceiver (reference numeral 17-2, 19-2, and 20-2 in Figure 1).

Response to Arguments

6. Applicant's arguments filed 4/18/05 have been fully considered but they are not persuasive. The applicant argues that Bhagavatula fails to specifically teach the bi-directional communications module. However, the opposite is true. As noted in the office action, Bhagavatula teaches this limitation in Figure 1. Given the broadest reasonable interpretation, and contrary to applicant's assertions, element 10 of Bhagavatula can be considered a bi-directional communications module being that it, as claimed by the applicant, also includes the first transmitter, the second transmitter, the first receiver, and the second receiver in a single box.

Regarding the applicant's arguments against the rejection of claim 13, the use of broad term "module" has allowed the examiner pick and chose which elements to consider as a module. As a result, the examiner has selected modules comprising elements at opposite ends of the fiber. Nowhere does the applicant recite a positional relationship between each of the modules, and only requires that the certain wavelengths be used. As such, the examiner has met the limitations of the claimed invention regarding the modules and the wavelengths they use. The only difference then is the configuration of the fibers, which the examiner feels, is obviated by the knowledge generally available in the art.

Regarding the applicant's arguments against the rejection of claim 15 and 18, the examiner stands by the opinion that the disclosure of Bhagavatula obviates the claimed invention given the fact that Bhagavatula teaches that the wavelengths propagated can either be the same

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or different. The examiner firmly believes that one skilled in the art could have selected the desired wavelength combinations to propagate on each fiber.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AB



AGUSTIN BELLO
PATENT EXAMINER